

TRANSCRIPT

INTERVIEWEE: **Tony Amos** (TA)

INTERVIEWER: David Todd (DT)

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DT: This is David Todd and I'm here in Port Aransas at the University of Texas Marine Science Institute on March 2nd, 1997 with Tony Amos, a marine researcher. And were going to discuss a little bit about his contributions to conservation in Texas and monitoring some of the changes in the environment in this area of the coastal bend. I wanted to thank you and sort of launch onto this with maybe a little bit of discussion on where you were born and some of your early years.

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TA: I was born in Kingston on Thames which is just outside of London and lived for the first seventeen years of my life in a suburb of London called North Cheam, which is the butt of some jokes in English circles but describe North Cheam, it's different than American suburbs and there's row upon row of houses joined together four at a time. And it would seem more of a cityscape perhaps than a suburban region to most Americans. Consequently and we were say ten miles from the center of London and I was a real city child. But I think that perhaps one of the things that maybe got me interested in the natural environment was the fact that I lived in the city and that every two weeks, I mean, for two weeks every year we would go on a holiday as did every other English family. And generally you go to the seaside and it was always a great thrill to me and my older brother who's three years older than me to

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see who could be the first one to catch a glimpse of the sea from we'd go by train generally and you'd see a glimpse of the sea between the hillsides and that was a great thrill. And if we saw a ship, especially a big ship on the sea, that would be something that would be very thrilling. And when we were at the seaside, my father would not take us to places like Brighton where they were full of the typical English seaside fair which are what they call fun fairs, amusement arcades you might call them, and the kind of the boardwalk type of location we would go to. In particular a place called Normans Bay, which is in Sussex and its called Normans Bay because its quite near, in fact, it is the bay where the Normans landed when they conquered England in 1066. And there's a number of interesting historical sites there. But one of the most fascinating right in this little town of Normans Bay, very, very remote and very small, I

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don't know what the population was, but right on the beach were what were called a Martello tower. And these were big circular towers right on the beach that were erected during the Napoleonic times when England had thought that Napoleon might actually invade. But as every English school boy knows and school kid knows that England has not been invaded since 1066, something we were proud of. But these Martello towers were

abandoned and they were great places to explore, right on the beach. The beaches there are very pebbly and not like a sandy beach of the South Texas Barry Island beach but at low tide, and there's a much greater range of tides there than there is than in here, at low tide there'll be great expanses of sand and tide pools. And my brother and I would always go and look at the fascinating animals that were in the tide pools, the shells and the limpets and the crabs and things. So I suspect

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that that might be one of the things that inspired me or got me really interested in the sea itself. And we used to play games. We used to play a very interesting game, as I say these were pebbly beaches, thousands and thousands, hundreds of thousands of pebbles of different sizes and we'd each select a pebble that we knew what it looked like and we would do this kind of, I don't know how to describe it, but it's like a jeopardy game of throwing our pebble into the sea, big pebbles, really big pebbles, and then trying to see if we could find them among all the others, wading into the sea. And they lasted sometimes, we think they lasted more than one year, we'd bring them back to London with us and then take them with us the next year. It was a great game.

DT: Recycle.

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TA: Yes, but also as I say, there was some kind of a nihilistic aspect to that game. Anyway, that was our fun. We were also both interested in birds, which I've retained of a sense

DT: You and your brother?

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TA: Oh yeah, yeah. And we were always fascinated to find birds. You know the suburbs of London then were devoid of birds except a few chaff finches and house sparrows and tree sparrows and Rock dove, pigeons.

DT: Why were they devoid of birds?

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TA: Well because I should perhaps explain that this area that we lived in North Cheam, was comparatively new then. I was born, by the way, in 1937 and this estate as they called it, was built in 1934. So it was comparatively new and a lot of the vegetation had'nt grown up then. Each house had a little front garden and a larger back garden, as we called it, fenced off from everybody else's next door. But I went back there recently, in fact last year, and the trees that they grew then that were just little saplings along the sidewalk outside our house are now quite large and the whole area looks much less citified than it did to us then. It looks, in fact, quite a nice place. But then it was a sea of red brick houses and, in fact, we used to play another game that could be considered to be slightly nihilistic now that I think about it. That was because all these streets were so identical, row upon row of houses, you could actually get lost there. Well we knew them very well. But the game was to blindfold one of us

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and then have the other one, you know, walk them around and walk them around the streets and then you had to say where you were, you know, you have to guess where you were from the number of turns you made and so on. But I think actually now and I come to recall my interest in birds probably went back before then. Being in London during the war as children, we were evacuated when the V-1 rockets were sent over in 1943, or was it 44, but somewhere around there. And so we were sent off to the countryside of Devonshire to

a really remote place called Oakford village. And it
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was like a fairy land to us because there was still great woods and streams and it was very, quite exotic. And there we had many more animals, especially birds that would come to the house. And I remember when I left there I was really worried that, we used to feed the birds and I was worried because there were nut hatchers that would come down and they were one of the birds I really liked and I was worried that they would not have anything to eat when we left. So my mother left a whole loaf of bread out for the nut hatchers to eat. And that, I guess, satisfied my young worry because I was only probably seven when I left then, seven or eight.

DT: So your mother was sympathetic.

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TA: Oh yes, yes. And so I suspect the interest in birds might have been engendered then.

DT: When you went to school, did you find that there was support for your interest in the outdoors?

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TA: No. I suspect there was very, very little support or lack of support. In other words, it was perhaps not a subject that was brought up in school. We did standard English from English literature, English language, mathematics, science, and physical training, and religious instruction. And that was it so, oh geography of course, geography, I forgot, geography and history were taught. And I think that the geography also fascinated me, in fact, I know it. And again my brother, I think if you're wondering who was one of the biggest influences in my younger life it was almost certainly my brother, older brother Eric. And we would have some of

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this smacks of rivalry and I'm sure it was, but it was a healthy rivalry because I was, you know, being the younger of two brothers although we had another sister and and a younger brother, rivalry is often keen when the younger one wants to strive to be as big, as we called it, as the the older one. So we would in the geographic sense, we would draw maps without consulting atlases and things, we did of course, we pored over atlases to see, you know, the shape of the land and the towns and the fascinating cities that were around the world, that we always wanted to visit. And then we would draw maps to see who could draw the most accurate map and normally of

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England, but I could probably still run off a map of England for you if you want. And so just the shape of the land and the interesting names of the cities was something that was fascinating. But I also recall wondering how on earth anybody could live anywhere else other than we were living at the time. I did not, I couldn't understand what people would like in somewhere else, I know that was a fascinating thing to me, but I could't think of it. I had no idea that I would ever, in fact, range the world. Because, at that time, I thought that living in North Cheam was the only thing that one could do or be.

DT: Did you leave Cheam to go to college?

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TA: No. In fact I should tell you right off the bat, I have never been to college. I have no degrees of any sort.

DT: A lot of experience.

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TA: A lot of experience and hopefully in this interview I'll explain how, you know, I came to be where I am right now.

DT: Yeah, please do.

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AT: No. We had some tragedy in our lives. My mother developed cancer and she eventually died of it in 1954. And my father who is also a very big influence in my life, from another aspect. My father did not want to live in England any longer so he took a job that was offered to him in Bermuda, the Island of Bermuda and he gave me the choice, I was then seventeen, of either continuing my education or going and taking up a job with the same company that he had got a position at. And I do have to explain my father a little bit if that's okay.

DT: Please.

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TA: Okay. My father was a tool and dye maker. He specialized in making tools and dyes for very, very fine pieces of electronic equipment, for cathode-ray tubes, Geiger counters and things like that. He was a master machinist and he was well known for that. But his early years, and in fact much of his working life was spent working on television and in the 1920s he worked with John Logey Baird who's the man that, in England you learn, who invented television is Baird. And he worked with him in the 20s and in fact in 1938, just before the war, they had a full screen color television system where they showed wrestling matches in cinemas. And, of course, when the war came along that ended all that sort of research because they had to go on to more things like radar. And my father worked on radar and Geiger counters and things to do with the conducting of the, you know, our technological aspect of the warfare and protection from things. Here goes my pager.

(misc.)

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TA: Yeah, well I was talking about my father and my leaving England. He got a job with a mad English scientist in Bermuda whose name is J.H. Owen Harris, spelled with an "i" which he was always at pains to point out to people that it wasn't plain old Harris, it was Harris. And Harris was a bit of a genius and he had invented then, he was a physicist, he had invented but not built a color television system that was at that time, this was 1954, was going to be when it was developed, it was going to sell for about three hundred bucks and it was going to sit on the wall. And interesting now you know that there are color televisions that sit on the wall, it was a

DT: LCD?

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TA: Yes, well no, it wasn't LCD, it was using cathode-ray technology but it was using interesting optical systems. And so my father went as the machinist to machine all the parts for the tubes and I went along as a general, kind of a, what do you go, dog's body as they say, but I learned an awful lot there. I learned how to and I spent eight years there. Eventually I learned my electronics there, I learned machining from my father, I learned chemistry. Chemistry was actually one of my best subjects in school and eventually what happened was that the backers, he did have backers that were from the U.S., he was a bit of perfectionist and he never wanted to demonstrate something unless it was in his mind, you know, proper and perfect. And consequently the backers eventually got tired of it and

withdrew some of their support. And so my father went back to England, I stayed on for awhile and then eventually left to come here to the States.

DT: When did you come to Texas?

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TA: 1962, oh Texas, I came in 76.

DT: And before that you were

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TA: I was at Columbia University and well I should perhaps tell you just a little brief bit more of that history if I can.

DT: Please.

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TA: Okay. Bermuda is a beautiful place and coming from the dull London after the war for a seventeen year old was pretty grim. I had no money, used to do a paper route to make seven shillings a week which was about a dollar a week for seven days a week work. And some of our rivals when I say rivals for the girls were the American servicemen who were there and they seemed to have everything. They seemed to have money and glamour and cigarette. Pall Malls was the currency, Pall Mall cigarettes was the absolute currency. That was so I'm not saying that was, in particular, a fact but it was one of the things. But London just seemed to be dull, the

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weather was dull, those red brick houses ran on forever and forever. You could smell the coal in the air, you know, it was still in the 50s so Thames was incredibly polluted. And coal was burned almost universally although my father had some thoughts about that and we burned coke, and remember people didn't use electricity to heat their houses. It was all fuel of some sort and coke was less polluting but I remember thinking when you wake up in the morning, two things struck you on waking up in the morning in North Cheam and probably almost everywhere else in London, me anyway, and the first was the roar of the traffic. You could hear this overlying, underlying sound if you like that was the sound of London. And secondly was the aroma in the air and I didn't realize what it was. I now know it was the smell of coal burning. And that combined with the weather, and the fact that my mother had died and my father went off,

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made me decide not to go on to university. Now I had already done the English system of education then, which was I think first rate. What will be the equivalent of graduated from high school but then, in the same school, if you reach a certain level in your graduation or your, what they call the ordinaries, the general certificate of education which everybody has to sit for

DT: Is this O levels?

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TA: Yes, O levels. If you did well then you can go on to do the A levels, that's another two years in the same school. All of a sudden, the class had become much smaller, there were maybe half a dozen kids in each class, maybe ten at the maximum depending what it was. And so I ended up doing physics, chemistry, pure and applied mathematics and that was all. So I didn't have to do English anymore, which I grew to like much more afterwards when I left and I didn't have to do and so we did essentially those four subjects. And that inspired me and gave me a lot of background, believe it or not, that I still retain, especially my math.

Algebra and calculus: I learned all my calculus in high school believe it or not. And, of course, went on a bit from there, so that gave me a pretty good background for the sort of academic, that's

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the end essentially of my formal academic training if you like. So when I got to Bermuda it was such a contrast, it was bright and warm and green and the sea was blue and clear and it was wonderful and I had a great time there. But after eight years the twenty-one square miles of Bermuda became a little confining and although that bolstered my interest in the natural environment and we used to go scuba diving and looking at all the wonderful animals there and in the sea, but I was ready to leave. And one weekend I took off for New York and never came back. New York was the closest big city on the way to Bermuda and it was comparatively inexpensive to fly to New York for a weekend. We did that every now and again. One weekend I went there and I didn't come back.

DT: And this was in the 60s?

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TA: 60s yes, and I applied for, you know, a green card and I got a job and I got a job in my electronics field then. I got a job in Philadelphia and I didn't spend very long there, I think about ten months. I got a job with an electronics company making tubes but I knew that wasn't for me. There's no way I could have worked in that semi-industrial background in the outskirts of another big city. So while in Bermuda, I had met with some oceanographers and technicians on board oceanographic research vessels from Columbia University, what is called the Lamont Geological Observatory at Columbia University. And it was, and still is, probably the number three oceanographic institute in the country after Woods Hall and Scripps Institution of Oceanography. So one day the research vessel VEMA came into

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New York and I met up with a good friend of mine, John Bastion and he said well, you know, you're not particularly happy doing what you're doing because I used to come back to New York every weekend. I'd go by train on Friday night and then I'd come back by bus at four a.m. on a Monday morning in order to be at work at eight o'clock in the morning, I just did not like Philadelphia and my apologies to anybody from Philadelphia. The city's changed a great deal now; in the 60s it was a pretty grim city. So, anyway so I went for an interview with Columbia University for a technician's job on the research vessel called the Robert D. Conrad. And I interviewed with the man called Sam Gerard who became a good friend, Robert Gerard but everybody called him Sam for reasons I do not know - never asked him. Sam Gerard looked at me and I had a beard by the way, I've had my beard since 1958 and

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haven't shaved since 58. I'll just backtrack a little bit. One thing that probably irked me about Philadelphia was people, ordinary people, not only kids, but people would yell things out on the street to me because to have fairly long hair and a beard in 1962 was apparently unusual. And the name I got called more than anything else was Fidel, hey Fidel, Fidel, people would say. Or what would they call out, a few other people - a historical note, the people would yell at me on the street. So anyway when I went for my interview, Sam Gerard looked at me and I told him a bit about my background. He said, well, he said, you've got a beard, you look like an oceanographer. He said, where do you want to go, he said

DT: You look like Neptune.

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TA: Yes, right. Well I did I when it was quite black then, both hair and beard. He said, where do you want to go? The Indian Ocean or the Antarctic? And I, you know, I thought for a bit and thought well, I'll go to the Antarctic. So after some training with what was going on on an oceanographic research vessel in 1963, I went off to join the research vessel Eltanin, E-L-T-A-N-I-N, and to do the oceanography of the southern ocean. I made four trips on the Eltanin initially, I spent almost ten months in Antarctica. These were minimum sixty days at sea then. And during that time and subsequent to that, the old method of doing oceanography was to use something, I don't know, your camera probably cant see it, but you see the device behind you there? That is a

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Nanson bottle probably in use for a hundred years or more as a method of collecting a sample of seawater and turning some thermometers upside-down, which when they got turned upside-down, registered the temperature of the sea water, called deep sea reversing thermometers. That way so when you bring them back up through the warmer layers of water they don't change the temperature and you can tell what it was down there. But that was the standard method of measuring the ocean oceanographically physically for almost a hundred years. But when I got into oceanography, electronic devices were just coming into being. And so my knowledge of electronics got me into operating the very first of the what was, are called, everything has an acronym, but the CTDs or which stands for conductivity temperature depth instruments. In those days they were called STDs, which was salinity temperature depth, but that's a minor point.

DT: Sexually transmitted disease?

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TA: Nooh is that was STDs are? Oh that's all right, okay. Anyway, so I operated the first of those at Columbia University and, in fact, probably some of the first that anybody every developed and used. And I did eventually go to the Indian Ocean and in 1965, I think it was, in the Indian Ocean we came across this remarkable phenomenon. We were in a calm sea, at least three hundred miles off shore and all of a sudden we heard a noise like a roar, a hiss. And on the horizon there seemed to be some very rough waves and yet there was no wind and when we came across this

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phenomenon it was a front, a visible front that went on as far as you could see in one direction, as far as you see in the other direction. It went from calm water to waves with white caps on to calm water to waves with white caps on and in amongst all this stuff was all sorts of animal life. There were sea snakes, there were young sharks, there were flying fish, just an incredible variety. There were birds feeding there. And also in amongst there it was my first real look at marine debris. There were coke bottles and wine bottles and garbage and...

DT: Any plastic?

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TA: I've written about it, in fact, I've got a paper that I wrote up there about it. I can't recall whether I saw any plastic but I could find it I could find it for you if you're interested. But there was certainly a lot of land-based debris in there. The chief scientist on that cruise was a man called Martin Langseff who unfortunately died just recently and I'm very saddened to hear of that because he was perhaps the man that inspired me to try and be more than just a technician on a research vessel. And what we did was, we went across that front

several times and we lowered our CTD instrument which would precisely measure the changes in temperature and salinity and as a function of depth, at very close intervals, outside of it and slightly in it, and then right in it and so on. And we discovered that what was happening was it was what is called a salinity front. The southwest monsoons cause, as you know, huge rainfall

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over the Indian subcontinent and the great rivers of the Ganges and up around the coast debouche into the Indian Ocean and this great lens of fresh water advances out to sea and there's a phenomenon called internal waves in the ocean, which is a comparatively recent discovery. These are just like waves on the surface of the ocean and the interface is not the air/sea interface but the interface between two different dense layers of water. And so this layer of fresh water lying on top of salty water was actually undulating with a frequency and that was causing this phenomenon that you could see on the surface, these (?)

DT: So you were having convection

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TA: Yes, yeah and this was actually discovered by the same man who made those bottles in the early 1900s, Nanson, because there's a phenomenon in the Norwegian fiords called dead water. And the sailing boats, the fishing boats that were all sailing boats then, of course, would have a fine wind and a great conditions and all of a sudden they'd sort of almost like they hit a bump and it would stop and so they called it dead water and nobody understood it. Well Nanson discovered that it was, in fact, the very, very fresh water of the fiords, a runoff from the glaciers and the snow melt and so on lying on top of salty water and when the keels of the sailing vessels went through this interface, they set up these internal waves which acted as a kind of a momentary barrier to their forward progression.

So we

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wrote a paper. In fact, we didn't write a paper right away but Martin Langseff said to me, he said, well look, why don't you write a paper about it. And I said, well I don't know if I'm allowed to do that, I'm a technician, you know. So he said, no I encourage you to write a paper about it. So I wrote a paper about it and did a lot of study about what I could. And then he said, why don't you deliver this paper at the annual meeting of the American Geophysical Union which was held in Washington D.C. then every year.

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TA: And then he said, why don't you deliver this paper at the annual meeting of the American Geophysical Union which was held in Washington D.C. then every year and I did. 1966, I went and stood up and for ten tremulous minutes and gave my paper. And then there's always the dreaded question and answer period afterwards you see, and the audience is full of eminent people. And I do remember one Woods Hall guy who's very well-known, was very well-known got up and didn't ask a question, essentially he said bullshit and sat down again. And I didn't really have much of an answer for that and I was really kind of demoralized a bit by that. And he didn't say it in so many words but he was saying, you know, well this could have been this and this could have been that and sat down you see. And I being

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unexperienced at that time in the backwards and forward banter of these sessions didn't

really reply to my satisfaction. But that was my first paper and after that, because I was the operator of this marvelous machine, the only one at Lamont who used it at the time, I started looking at the ocean from that perspective and

DT: Internal currents?

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TA: Well no, just the whole, just oceanography. Rather than just measuring it, I decided that why shouldn't I also try and understand what it means, you know. I should say that technicians generally keep the equipment going and do the measurements and don't normally write papers about it. So that's really what got me into the more academic side of science and I haven't, I don't think I've looked back since.

DT: I'm curious, this is sort of a detour, but it seems like the little I know about science that there's often been this divide between theoreticians and sort of the more abstract folks and then the people who actually design and build the machines to test those theories. Which camp do you find yourself in and

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TA: Oh definitely not in the theoreticians. I'm in the, in fact, I'm what they call a descriptive oceanographer. I'm not a modeler, you see especially in oceanography and atmospheric science, there aren't many other sciences, there's a whole group of people that model the systems and do it with abstract, abstruse I should say, mathematical formulae that are very difficult. These are very, very brilliant people but they don't even have to go to sea to ply their trade. Some of them are very poor sailors that don't go to sea. They work on these very high speed computers to model. This is a very important aspect of science. If

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we are to understand how things are going to be, we must have some supportable theories that allow you to do long-term predictions and so they're very important. But the one thing that I have on my side is the modelers always say, hey we need some ground truth, we need to know whether our models are correct, you see, so they call it ground truth even though it's actually sea truth. And so I guess I'll always be in demand to go down and measure and write descriptive papers about what it is, without getting into the modeling or too abstract aspects of it.

DT: I read not too long ago about a botanist and a biologist or maybe an ornithologist who died together in a plane crash and there was a lot of sadness about that but there was also lament about the fact that field researchers are a rare breed and that there are many more people who tend to be interested in sort of microbiology rather than the grosser sort of field biology. Is that true in oceanography?

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TA: Well because we in order to, you have to go into the field essentially, oh well that's not true now because there's such a lot that's being done from space now, a huge amount of oceanography is being done from space - another very important aspect. But I don't know whether there are fewer field oceanographers so to speak, than there are theoretical guys but that's probably true, but I hadn't really thought of that before. I'm definitely a field guy but this last cruise I went on down to the Antarctic, not only do we have to be the principle investigator for the University of Texas as part of this research, but right there on the ship, I have to produce a report before the ship gets into port. That's part of my contract with UT, to produce a report that says something about the science and what has been done. So there ought to be a bit of both.

DT: So the boundary is not that clear, maybe sort of gray.

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TA: No, no. There's no doubt that I'm not a theoretical oceanographer, I'm a descriptive oceanographer.

DT: Could be talk a little bit about some of the descriptive work you've done here on Padre and Mustang Island?

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TA: Yes, of course. Now that sounds like a great departure from blue water oceanography which I've done, and I still do. Let me just digress just a little bit if I could. When I got into oceanography, almost everybody who was going to sea was going into the great ocean expanses, to what we called blue water oceanography, deep-water oceanography. There was not so much diplomatic boundaries of peoples, you know, the different countries' boundaries of the ocean, were not so stringent as it is now. It was twelve miles and you could go in to within twelve miles of any country and do your oceanography, measure whatever you like, take samples and so on, but when the two hundred mile economic exclusion zone came out more or less universally, then oceanography changed. And because we no longer could we just go with impunity into say Brazilian waters or

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Mexican waters and do what we've been doing all along. So the attention turned more to coastal oceanography in our own backyard where there was, of course, no restrictions. And I became less of a blue water oceanographer and more of a coastal oceanographer looking in shallow water when I came to Texas. I still do go to the Antarctic almost every year and I still do some of that more blue water oceanography but when I came to Texas, the emphasis was on trying to understand the exchanges of water between bays and estuaries and so on.

(misc.)

DT: So talking about coming to Texas, when was that?

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TA: Oh, okay. Let me tell you about why and how I came to Texas.

DT: Please.

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TA: The director at Lamont Geological Observatory was a Texan by the name of Maurice Ewing, fine old Texas name as I'm sure most people know who watch television.

DT: J.R.

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TA: Yes. Well, no, this was Maurice Ewing, he was a very eminent geophysicist. He was a man who was instrumental in discovering such things as the mid oceanic ridges and the sea floor spreading, he added to that theory and is a very eminent geophysicist. He had an argument with Columbia University because the Lamont Geological Observatory he had founded and was kind of an adjunct to Columbia with academic ties to Columbia. The Doherty Foundation had left a huge amount of money and Ewing thought that that money should go not to the University but to Lamont for furthering the work in oceanography and not so much to the, sort of the mother university if you like. So because that dispute didn't get resolved, to my knowledge, this is what happened. Ewing said, right I'm going to go to Texas and I'm

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going to take the research vessel VEMA, which was the name, VEMA, and all my top people and we're going to go to Texas and set up an oceanographic institute. And I think he said something like the biggest god-damned oceanographic institute in the country. I'm not so sure all that's true although that's what I heard, but I don't know. He did part of that. He was unable to get the research vessel but he did take many of his top people to Texas. And he became director of the, what is called the Galveston Geophysical Lab. Now at that time shortly after that, well to finish off the Ewing story, he died before he could realize his dream of setting up a large oceanographic institute to rival Woods Hall and

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Scripps and Lamont. But the mechanism was being set and several other people came from Columbia University including the man who is director of this place then, a man by the name of Oswald Roels. Now I'd known Roels before, I'd done some work with Roels and my wife had worked with him quite closely. So when Roels came to become director here and we then had a sister research group which was the Galveston Lab, we were supposed to be sister laboratories, one in Galveston, one here. And this was going to be the nucleus of this big time oceanographic research institute. So anyway, when Roels came here, he induced my wife and myself to come and come to Texas with him. I was not too happy about that. I liked the northeast. Lamont was not in New York City by the way, it was north of New York City on the Hudson River. And we lived in a little town called Piermont that was rather, again I've always lived near the water, by the way, except for my first seventeen years, always lived near the water. And we lived on the three-mile wide

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Tappan Zee and north of New York City. So I liked that environment, I liked the proximity of a big culturally fine city and I also like snow and I like trees and I like hills. And when I first came down to South Texas, I didn't see very many of any of these things. But however, I was convinced. I had made all the moves in our lives before, my wife and I. Incidentally, I didn't even say that I was married in 1958, in Bermuda, my wife was Bermudan and whom, I think, did you meet? Maybe you didn't. I don't know if you did.

DT: Last night?

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TA: No she wasn't, she couldn't come, she had a headache. Anyway, so, Lynn said, well look, you've made all the moves so far, let you know, I want to go, I'm ready for a change. So we decided to come down here. I spent almost a year here before I decided and I decided this was not the place for me and I was about to go back to New York to get a job with Columbia again cause they always left the job open for me, you see, they didn't want to lose me. And anyway, one day in April, it must have been, I don't know what year it was, probably six, I don't know, 77 maybe, yeah. I was looking out of the window of my house in Port Aransas and it was one of those phenomenal bird migration events and I counted forty-four different species of birds without leaving my seat looking out of the window. And I thought, well maybe this place isn't so bad after all. And I'd also been convinced, by the way, and

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persuaded by a number of Texans to stay and, you know, you were asking about influences in my life. I think those were certainly ones that I followed. The argument was that Texas was developing as a state that had fine research ability but they needed people from perhaps from outside to come in and help them gain that goal, especially in the coastal area. And I thought about that for awhile and I thought, well okay, it's reasonable and given the

fact there were all these birds here, maybe I could stand the flatness and the heat and the lack of trees. So I decided to stay. It was shortly after that that I thought well, okay now I'm here, what can I do other than do my oceanography cause, you know, oceanography is an interesting science if you're a field oceanographer, it can take you to all parts of the world.

So you

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do get an opportunity to see other things even though you might be headquartered there are oceanographers from Arizona State. There are oceanographers from Chicago. So you don't need the ocean itself to be on the back door. But I realized that this was a place that had wonderful variety. I thought at first it was not very dynamic, I now realize it's a most dynamic environment. We have right in our own backyard here, we have the bays, we have the Gulf of Mexico, we have the Barrier Islands, we have the wetlands, we have the Laguna Madre's unique area of the coast, you know, highly productive area and we have the off-shore oil industry and we have the growing cities, we have the petrol chemical industry, we have the fishing, and we have many things and a potential for growth, many things that might tend to be injurious to this environment, and the birds and the other animals. So anyway, to make a long

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story short, I decided to stay and I but I decided I'd better do something other than just go to sea. And that was when I had been going out in the early mornings to count birds. I've always done that for years, and years, and years. And when I was in New York, I would get up in the early morning and go out at dawn and go for a trip in the woods and just make notes of all the birds that I'd seen and all the other things that I see. But here it was different. There were, if you went out on the back side of the island where the mud flats are, the birds were spread out in such a fashion that there's no way you could possibly really try and count them. And so I thought, well I'll have to find some other place. And I found the beach and I noticed that most of the birds were all

175

lined up neatly along the edge of the beach and were quite countable. So I started going down there in the early mornings and casually, although I always make notes, I mean I don't know if you've seen, if you noticed – anyway my notebooks are in the cabinet there. Look down, there's something like two hundred and thirty notebooks there.

DT: Your field notebooks.

179

TTA: Yes, my field notebooks. And so I started entering my information in there, in those, and I realized that I saw all these "for sale" signs along the island road here and on the gulf side and I noticed at that time in 77, 78 that condominiums were being advertised as about to come. So I thought it would be a very interesting study to see what happens to a comparatively pristine beach environment if it eventually became what I call "condominiumized", or "Miamiified" if you like, because it looked like there was nothing to stop there being wall-to-wall condos along the dunes.

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And I thought if that happens, then there's going to be more people here and there's going to be more disturbance. And let's see if I can establish a baseline measurement of because it's very important to have baseline. Whenever you see discussions in the press or anywhere else about long-term changes and things, you always look back to some reliable

measurements that were taken some years ago historically. And you say, whoa, this is what it was then, this is what it is now. So I thought it would be very interesting to get baseline study because I kind of felt doomed, I thought well all these beautiful birds that are comparatively undisturbed are going to be run off by thousands of people on this beach cause they're all going to pour out of the condos. So that became theme of my study which has gone on to this day and, in fact, I did one this morning, I took my... Can I, is it alright if I move out of the field of vision for a sec?

DT: /font>Maybe you could tell us what you saw this morning.

206

TTA: Okay, well this morning was my two thousand five hundred and... All right?

DT: Fine, thank you.

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TA: my two thousand five hundred and eighty-sixth observation of Mustang Island Beach and I started at 7:16, it was a bit late, I sometimes get into a syndrome where I can't quite make dawn, but then I get out of it and I do all right. I like to start at dawn. I ended at 9:01 which was a hundred and three minutes and I saw twelve eared grebes, five double crested cormorants, four black bellied whistling ducks, eleven black bellied plovers, four piping plovers, hundred and six willets, four ruddy turnstones, four red knots, two hundred and eighty-seven sanderlings, ninety laughing gulls, hundred and ninety-two ring bill gulls, eleven herring gulls, eight Foster's terns and then I also saw eight, I mean sorry, only three cars, it was very unusual, you know the big storm

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came in this morning and there were far fewer people and far fewer birds on the beach, twenty-three people, one dog, I count cars, peoples, and dogs, for a total of four hundred and sixteen shore birds, three hundred and twenty-two other kinds of birds, six show bird species, seven other species. There were a couple of people camped on the beach and I make a note of that, two camp cars, and three camp people, there could have been more. I don't actually peer into the windows of the campers to see who's there but I always assume that there's at least one person if I see a car camp. There were two dead birds on the beach, one was, no both double crested cormorants. The trash was really loud cause it had all been blown away. I count five categories, five distinct kinds of items of trash every day I do this. Milk jugs, one gallon milk jugs, beverage cans, egg cartons, chemical drums, those are the five gallon pails and

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things with chemicals, and the green bleach bottles that come from Mexico. Today there were only three milk jugs and six beverage cans on the beach. Now this is only on the beach, I don't count the stuff that's blown up into the dunes, this is only the stuff in the wash zone.

DT: /font>What area do you visit?

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TA: Okay, well I start at access road number one which is just south of Port Aransas and there's a seven and a half mile length between access road number one and number two. And this is what determined my scientific parameters that I could drive in the beach on access road number one and twelve kilometers later could drive off the beach. And I thought it's a reasonable length of beach to study. I have a little computer that I use, although I started out with a clipboard on my steering wheel and I would write things on

the clipboard. I now howoh I took it homewell its (?). This is one of the dead ones, although it's actually not quite dead, it's still alive, you know, it's still alive. This one has been handled quite a lot, it's been dropped, it's been, one time I put it on the roof of my truck and forgot and I drove to the beach and when I got to the beach, I couldn't find my computer and I thought, oh I must have left it at home. So I drove all the way home, couldn't find it there. And then as I was driving back, I thought, well maybe I've dropped it somewhere and as I was driving back in the middle of Port Aransas I saw it in the gutter. It was

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raining at the time, this one, this very one. I picked it up, turned it on and it functioned. They don't make them anymore like this. This was 1984. They don't make them anymore and, which is a shame, and I can't get any bits for them but I did manage to buy two others. And so I cannibalized bits from one to the other because, although I could use a laptop now, I developed the program here, you notice I've got, I don't know if your camera can see that, but I have a special template so that when I press this button it's a laughing gull and a sanderling and so I have all the common buttons on this side so I can actually drive and key in.

DT: /font>What do you call that?
268

TA: OOh, this is, this was actually my "garbajobs", this was copyrighted in 1987, I don't know what it means to copyright something but I thought I'd put a little "c" on cause I designed all this when I started doing surveys just for garbage. So, in addition to my two thousand eight hundred and, what I said, two thousand five hundred and eighty-six beach surveys, I've done at least three hundred surveys where all the buttons that had birds on them are now being replaced with, I have a milk jug button, a plastic button, a rope button, a float button, a cotton, Styrofoam, hard hat, 55-gallon drum, beverage can, green bubble pail, plastic bag, Portuguese men-of-war, and I also counted them. I'll tell you another thing that inspired me to do this which is kind of amusing. I used to

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listen to the radio when, before we had National Public Radio, I used to listen to whatever I could find and often they would say, and here's the beach report, they would say. The waves are four feet in three rows and there is a little Portuguese man of war and there's no sargassum weed, the beach combing is good and the beach driving is good. And I'd look and I'd say, I don't think they're looking at the same beach as I am because it's nothing like what it really is because they're sitting in the studio somewhere and some surfer has given them the daily report. They still do this by the way, of course, you know, this is like the surfing report. So I thought well let me find out what it really is. So I count Portuguese man of war, cabbage head jellyfish and I estimate the amount of sargassum weed and I've

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been doing that for a long time. And, but I don't actually count those things. I did on my garbage surveys. I counted them because I thought it was really important that you knew that whenever a slug of garbage came in it often came in with a slug of natural debris too and I thought you can't understand one without understanding the other. So I did natural debris. On my bird survey I have an estimate of zero to five for all these things, something like forty different things. And although it's highly - I think my scientific colleagues would shudder if they thought that I'd ever decided to do something as arbitrary as saying okay zero is nothing and five is as much as I ever see and I try and rank them in between. But

that data's become very interesting and it shows when the Portuguese man of war really come ashore. Even if it was like no Portuguese man of war and many Portuguese man of war, I think it would be useful to do something like that.

DT: Is it that man of war have very little control over where they go?

313

TA: Oh yeah, they go with the wind, yeah.

DT: They have little sails.

313

TA: Yeah, they have sails. And did you know there are left handed and right handed Portuguese man of war?

DT: I didn't know that.

315

TA: Yeah. And they're from off South Africa. There's a paper that I have that suggests that depending on the handedness of the Portuguese man of war, they'll be either in the current on one side or the other current on the other side. And its really interesting, quite a serious paper.

DT: Thinking about some of the debris you see, say the green Mexican bleach bottle. What do you think its life has been, where has it started and how's it come here?

323

TA: Very interesting. That's a very interesting thing. The green bleach bottles from Mexico are one of two main brands and several other brands. I think the world seems to think that if you have a bleach bottle it's got to be green, after our own Clorox, which is green. But there are two brands in Mexico, one's called Cloralex and the others called Clarisol. And then there are several other in between. Some of them have blue bottles but essentially I call them all green bottles. They're plastic bottles and they range from probably three hundred milliliters to big ones, so several liters, but mostly you get them about seven hundred fifty or a thousand milliliters, about a quart size or less. I find you would think, okay if you find bleach bottles that comes from domestic garbage therefore, you should see other domestic garbage also. I

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don't. I don't see a lot of Mexican domestic garbage. But I do see from Mexico these green bottles especially, and I'm talking about thousands of them sometimes. On San Jose Island I once counted over two thousand of green bottles from Mexico. I see outboard motor oil from Mexico and you have to look at it carefully because it says things like Yamaha Mobil and so on but it's all Mexican, its made in Mexico. I also find our own outboard motor oil cartons too. I don't want to just put the blame only on the Mexicans. But apart from those two items, I don't see a lot of regular domestic Mexican garbage. So it makes me think that this stuff does not come from bad landfills that have their contents washed out to sea. No, I'm quite, you know, quite convinced that it comes from the Mexican fishing industry and the bleach is used

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for a specific purpose and its not to bleach one's clothes but to perhaps treat the shrimp. Our shrimpers use sodium metabisulfite to treat shrimp for a condition called brown spot or black spot, which makes them unmarketable even though allegedly it doesn't do any harm to the shrimp. And the way to get rid of it is to soak it in sodium metabisulfite but I suspect that's also the way to get rid of it and a cheaper way is to soak it in bleach. I'm not, I

don't know, I'm not a hundred percent sure because I've never met any Mexican shrimpers and I don't want to malign them unnecessarily but I have had it told to me by others that this is probably what that's used for. So, anyway, I lost track of your question which was?

DT: No I think that's good, I was curious where these things might come from because they've come hundreds of miles.

377

TA: Oh yeah. And in fact if you go – you know, I've more or less traveled the entire length of the Gulf coast from the Rio Grande to Louisiana. I've probably visited all parts of it now. I was in Louisiana in the outer islands, the Chandeleur Islands a few years ago and I noticed one or two green bottles out there but very few compared to down here. So there's kind of attrition as they get further north because the currents will start to come from the north/south when you get up in that area.

DT: And these are ocean currents or wind currents?

389

TA: Ocean currents. Yeah. Now, wind does something because if you have an empty bottle and it doesn't float deeply, then the wind might have as much an effect on it as the current.

DT: Do you have a category for oil rig hats?

396

TA: Yes I do.

DT: I remember going to Matagorda Island once and picking up eight, nine in a stretch.

398

TA: Oh yeah, well I don't know what my record is for hard hats but its probably many, many hundreds though it's interesting to read the logos on them. Talking about another interesting category is just ordinary hats. You'd be surprised how many hats get washed off, get blown off peoples heads when they go out deep-sea fishing.

DT: Gimme hats.

407

TA: I have a whole, well yeah gimme hats or, people, you know, people buy hats with somebody else's advertising on them, pay a lot of money for it now to advertise somebody else's, somebody's product. Was I doing that? No. I was advertising a ship, the research vessel, though I don't mind advertising that. The

End Tape 1, Side B

001

TA: a lot of money for it now to advertise somebody else's, somebody's product. Was I doing that? No. I was advertising a ship, the research vessel, though I don't mind advertising that. The hats – and I've got a whole collection of hats and have categorized and put them in – just made a list of all the logos on them and it's quite fascinating. Even got one last year that said it was an official Super Bowl XXX or whatever it was hat, but, I mean, one that belonged to an official, not an official hat. It had a kind of, what do you call those things, holographic, I don't know, thing on the top to identify it.

DT: That must been quite a recent thing. I'm curious if you can tell if some of these things have been in the ocean for many years and only just now come ashore but had floated out there for many years.

011

TA: The – perhaps the most – you know, one of the things that I've done as an oceanographer is take photographs of the ocean floor with a camera that you lower over

the side and, you know, go down to the depths and we photographed beer cans and things. And you can tell from them, if you can still read the labels, you can tell that some of those cans have been obsolete for a long time. That's slightly different because you would expect them to stay on the ocean floor. However, along our coastline, we have the morphology of the just offshore region, sandbars with what the fisherman call the gut in between the sandbar. So, so its like a bar and then a ridge and then a, I mean

018

then a trough and then another ridge and a trough and there are three of these sandbars. Now the troughs in between these sandbars are collection points for all sorts of debris. They – we're talking not only man-made debris but also a lot of natural debris. Sometimes, especially in January and February, or January, we would get storms and very low tides and some of that material will get washed up on the higher part of the beach. I call them beer can reefs because there are so many beer cans associated with these things. Now what I believe has happened is that the beer cans themselves roll around in this kind of trap that is the trough in between these

026

sand dunes – I mean sand bars – and I had an indication of how long some of them might have been there a few years ago when Coca Cola went through its ill-fated or designed change from Coke to New Coke. And the – when new coke had been around for a long time before they decided that the public didn't like it and they went back to what they then called Classic Coke, I was finding old Coke cans that were washing up say two years after the last had been in circulation. So a couple of years I know, I suspect a lot longer for some things. I found many messages in bottles and, in fact, I can spot them a mile off. I have a whole file in there of messages, of the messages I've found in bottles.

DT: Could you read some of them?

035

TA: Sure. Okay. This one was an interesting one. It was dated on March the 6th 1989 at 3 a.m. And it says, here we are out of Key West Florida on I don't what name of the name of the ship, doing our best, dah, dah, dah, I don't know what name there, with a precise location of where this bottle was put in. It says, please send postcard when you've found this bottle and date. I dropped one here in 1965 off the American Mariner which is a commercial vessel and it came ashore at New Smyrna Beach just south of Daytona Beach, Florida eight days after drop. Let us see how long and where this ends up. Thanks. Yours, so and so and a name and address. Now I found this, it had traveled a long, long way and unfortunately the guy who did it was in the military and he shouldn't have done this, he revealed the position of the ship which was on

DT: It was on maneuvers and slightly classified?

048

TA: Yeah and I think he got into trouble then because I went to the Coast Guard because I didn't know the name of the ship and I didn't have a clue, you know, and I asked them if they knew the name of that ship and they did and I think he got reprimanded. I did write him back though.

DT: How did it come do you think? It crossed the Gulf?

051

TA: It came, yeah, right across the Gulf of Mexico, yeah, and it was phenomenal because it took, I wonder why – I wonder if I have the – it probably traveled at a speed of somewhere

near five knots. And the reason for that is that the bottle was not weighted down and most of it was sticking out and was blown here essentially because there's no currents that are sustainable at five knots in the open ocean. So that was an interesting one. Then this one – I just run these at random. These ones, Cuban Academy of Sciences Oceanographic Institute. "This card is part of an experiment for predicting the oil pollution in the sea. Please answer the following questions and return this card at 059

your earliest opportunity." And so I did and I found several of these but I also wrote to them and I said, "I'm an oceanographer. I'd really like to know where you put this in so I can have some information." And I've never had any reply from them at all. I don't even know if my messages get to them or not. So, and it's a Cuban Academy of Science.

DT: So some of this is quite serious, I mean it looks like a form and they print it out. 064

TA: Oh sure, yes, oh yeah, that's, yeah, that's a form. I copied this because it was in such bad shape, oh wait a minute. So this is the actual original but I copied it and sent them a copy because this was wet and... This was interesting. Reward, reward, return this card, return of this card can provide valuable scientific data. Below please write where and when you found this card. No postage necessary. One dollar reward for each card returned. This is National Marine Fisheries. So I sent it back to them and I said don't send me the reward because I'm in this business but I'd just like to know where you sent it off. And I can't recall, I presume they answered me, but I can't recall if they did or not. They never sent me my dollar anyway and I didn't ask for that.

DT: When you get some that are not quite so scientific? 073

TA: Yeah, well here's one. (?) Miss (?), date 2-22-93, time 1:55 p.m., it was hauling the barge (?) 2503, cargo empty, speed 8 knots, location 29 north, 9351 west, wind direction, departed Charleston, South Carolina 9-2. If this bottle is found please send info to where, when, why, and how found.

DT: No lonely hearts 079

TA: Oh we got, oh, you haven't heard 080

TA: This one was a pleasure cruise in the Gulf of Mexico, light southeast breeze, everybody happy, beautiful sunny tropical days. Call this number for a good time. And it gets worse after that, so we won't continue on with that one.

DT: Are you censoring these? 083

TA: Yes I am, I mean I don't have to if you like, but 084

DT: No go ahead. 084

TA: Censor them? 084

DT: No don't. 084

TA: Oh all right, well since you're taping, I'm censoring them, I don't want to get people into trouble but...

DT: You can avoid names.

085

TA: Yes. Call this number for a good time. I give great head. Great sex wanted now. I'm waiting, waiting for the great one. Sex, sex, and more sex. And then at the bottom it says, help, save me from these crazies, multiple orgies aboard this ship.

DT: That explains a little bit why you're interested in censoring – well let's talk about
090

TA: Well, I don't have to – there's a couple of others that are really nice. Well this one was beautiful.

DT: Some artwork?

092

TA: Yes. Its a poem, a great poem.

DT: Please read it.

094

TA: If I can. And in the dream I was walking. It was a pier or jetty but really just a walkway across a bay or sea or something. The walkway was barely shoulder height and off to the right I saw the giant shark, red, furious. I was so scared, eyes forward, and he kept leaping out of the water, thrashing something and then a great splash in the water with his tail trying to be like a whale but he couldn't, he couldn't, and I smiled and I knew I was safe.

DT: A happy ending.

101

TA: Yes. And there's some – Kristine it looks like. I've got kids, I get great ones from kids. This one and I've corresponded with these kids and, in fact, I've set up a correspondence with two Texas kids. And I will not give names, of course, here but you can see the beautiful work that they did. And what they said was if somebody finds this, if you're a kid, please write to us. If you're not a kid, please throw it back in the sea so a kid can find it. Well, I realized if I threw it back in the sea it would never go anywhere. So I wrote to them and I said, well I'm not a kid but what I've done with your bottle, I've sent it off on one of our research vessels and it's going to be put back in the sea in the middle of the Gulf of Mexico and we'll see what happens. But then they wrote to me and they said, please, we're very interested in oceanography, please could you, would you become our pen pal? So I've actually become these kids pen pal.

DT: That's very nice.

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TA: And then another one, just before, I know I don't want to dwell too much on this, but these were two kids, they wrote the message in French and this was one of the longest ones that I've had. It was found four hundred days later by me. It came from Martinique and I thought they were French, and they were French but so I wrote back to them in French. You know I remember my high school French that I haven't really used French ever since, wrote them a letter. They were French Canadian from Quebec and they were on vacation in Martinique. And since I've set them up with some kids of their similar age in Port Aransas who are writing to them in Quebec because they wanted too to establish some correspondence with children of their own age so

DT: Very nice. And there's a great faith there that somebody will pick it up and will respond.

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TA: I've got hawk eyes when it comes to a message in a bottle, I can spot them from over

there, I mean.

DT: You've got a nice collection.

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TA: Yes. And it's interesting to me as an oceanographer although it's an untrustworthy way of trying to determine what currents are doing but at least you have some idea, you know. And for a while it was one of the major ways of tracing currents. I have a paper written in 1903 of some drift bottles that were set into the sea in England and recovered mostly along the Irish coast. And there was a remarkable recovery rate. And it's been done in the Gulf of Mexico too. Thousands of bottles were put in in the 60s but that's become, now people are a little more wary of doing that because it's actually a form of pollution. It's like sending balloons up. And one of the things I find on the beach many, many times are balloons. And one of the things I find in the stomachs of sea turtles are bits of balloons so.

DT: Well so your concern is more, not only the esthetics of litter on the beach or what they might indicate about currents, but also what they do to the animals who might ingest them.

138

TA: Yeah. In fact, if you want to stop your machine I want to show you something else that I find all the time on the beach.

DT: Sure.

140

TA: Are we there?

DT: You are.

141

TA: Okay. This is, this is a radiosonde and this is a device that every weather station in the country sends up two or three a day. They get hoisted aloft by helium balloon and they go up through the upper atmosphere measuring the temperature, the barometric pressure, and the

DT: Could we pick it up and hold it higher?

145

TA: Yeah, there it sits full of sand so because it landed on the beach. There's a battery in here, there's like a little electronic device, its electronic, I'm sorry, it's electronic and there's electronic circuitry, there's a hygrometer for measuring humidity, there's a temperature sensor and a barometric pressure sensor, a little can. You see it. Oh yeah, there's that part there is like an aneroid barometer. And then it moves a pointer on here which then sends a signal and now the whole thing gets transmitted back down to earth

DT: So they're not retrieved, they just broadcast.

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TA: No. They broadcast and then when the helium balloon bursts, they fall to ground, you see. Now, they're put up by our National Weather Service and National Oceanic and Atmospheric Administration, but I think they also pollute the beach. So, however, they realize this and what they do is inside the little flap here is an envelope which I've unwrapped here and it says please return, please return. It tells you when it was released and where it was released and it says please return, put the information where you found it because we can recycle this stuff. Now I realize that there's probably very little of this one that fell in the sea to be recycled but I return them because I give them information, I give them precise coordinates of where I find it because I have a global positioning system on my truck that I can tell exactly where our latitude and longitude. And then I pop it in the

envelope and I send it back to them because they actually pollute our beach, another form of pollution. Its necessary for, because without that, you wouldn't get your local weather man telling you what the weather's going to be. This is the essential – the essential method of understanding what the weather is other than satellite.

DT: And where was that released?

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TA: That was released and most of them are released that I find here are mostly released in Corpus Christi or Brownsville.

DT: Well let's talk a little bit about the animals that you find on the beach, not so much when you're doing a bird count but maybe some of the dead animals, the stranded animals, some of the injured animals, and what you see and how you respond to them.

172

TA: Okay. When I started this surveying, almost right off the bat I realized that there were – there were a number of dead animals to be found and these include birds, of course, sea turtles, and dolphins. How to start. With the sea turtles, lets start with sea turtles. They – they wash ashore at different times of the year, mostly during the spring and fall. And they are in various states of decomposition and they are in various – there are five species of sea turtles that can be found in the Gulf of Mexico. The loggerhead sea turtle are most common, the Kemps Ridley, the rarest, the green turtle and the hawksbill perhaps that's even rarer than the Ridley here, though not rarer in general, and the leatherback. And I find them all, I've started finding them all and I eventually joined

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up with the Sea Turtle Stranding and Salvage Network and the Texas Marine Mammal Stranding Network which I was probably one of the original members and still am, I'm still a member, I'm on the board of directors of that. The idea of these organizations is to try and understand why these animals come ashore, you know, what's happened to them and stranding, what a stranding means is when an animal, a sea animal in this case, is up on the beach it is considered to be stranded whether it's dead or alive. Find mostly dead animals, but we also find, and I started finding early on in my career, live sea turtles and also not so long later some live dolphins which I'll tell you about. But the sea turtles, the live sea turtles, come up, sometimes they have some injury, sometimes they're wrapped up in mono filament line, sometimes they're entangled in an onion sack, sometimes they've got tar in their mouth.

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Sometimes, as happened this year, they've been stunned by a particularly cold snap and the water temperatures got so low they could no longer function properly and they – they just wash ashore, they no longer swim. So – so we find these animals and the ones that are alive, we attempt to rehabilitate and do rehabilitate many of them. And the ones that are dead, however, there is a, especially with the sea turtles, there's a particular method or reason for them dying in this area and that is that they get caught in shrimp nets and that they drown. This is a general thought on the part of most people except the

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shrimpers that the – that most of the sea turtles that wash up dead are because of shrimping activity. Now having examined numerous of these animals, probably I've handled over a thousand sea turtles since I've been doing this, I realize that there are other reasons for sea turtles washing up on the beach other than getting, dead, other than getting

caught in the shrimp nets. However, I do believe that perhaps the majority of the dead ones have drowned in shrimp nets. The evidence that we have is sometimes circumstantial. First, they're never adults so – so we never – so they never have died of old age. Secondly, they often come ashore looking as if they should be alive but they're

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dead and – and so drowning is one, and they have water pouring out of their mouths on occasion. Thirdly, they often come up in numbers when there are most shrimp boats out there visible from the shore although we know they're out there. And there is a sudden drop off during the period when the shrimp moratorium comes into effect. And that is the period normally from in June and the very first part of July when, and even the shrimpers agree with this, shrimping is prohibited to allow the brown shrimp juveniles to migrate across the shelf of the Gulf of Mexico. Because if they took, excuse me, if they

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took them at that early stage they would definitely affect the population of shrimp, the shrimping activities. So there are no shrimp boats out there during that period and the numbers of sea turtles drop precipitously during that period and they pick up again around July the 15th when shrimping starts again. That's circumstantial. As with anything, when you're trying to determine what is happening by looking at some aspects such as numbers, it – nothing is ever precise and cut and dry. Because during that period when there are no shrimping, we still get a few washing up dead. And so the – the problem is that most environmentalists think that every sea turtle that comes ashore is due to shrimping. And most shrimpers think that none of them are, and the people sympathetic with the shrimping industry, there's a lot of people around here think that none of them are due to shrimping. The truth lies somewhere in between.

DT: In areas where they have pretty good success, when people were using those TEDs,

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TA: TEDs, Turtle Excluder Devices.

DT: Do you have as many strandings?

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TA: We thought, I thought, from my data that – that incidentally I pick up around, on average around seventy sea turtles a year but this year it was a hundred and thirty-two or something, it was a phenomenal number. Immediately after the mandatory use of TEDs, or the use of TEDs was mandated by law, we had a real low year. That was two years ago, or was it 94, and I thought, ah, its working. Then we had a disturbing thing where we were getting a number of small animals, quite, quite small animals that were washing up dead and we realized, I realized, perhaps the TEDs aren't – wouldn't – work for those small animals, that's a possibility anyway. And it wouldn't work for really big

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animals too, you know, like leatherbacks. We had a number of leatherbacks last year and the year before and it was never determined what killed those – those animals. Leatherbacks – I'm talking thousand pound animals. And I suspect that they got in, they'd never pass through the – the opening of the TEDs.

DT: Too small.

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TA: Yes.

DT: I see.

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TA: Now the – the other controversy is whether these animals have been – you’ve heard the term mutilation used a lot.

DT: Chain saws.

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TA: Yes, there’s no doubt that many of the animals come ashore with no heads and no limbs. I examine every one that I find out there carefully and take photographs to see if I can see things like knife cuts and so on and sometimes I do see that. Other times I see definite evidence that shark has taken them, you can see the jagged edge, you can see the shark teeth where the shark teeth have bit. Even then, you don’t know whether the turtle was alive or dead when the shark took their limbs off because they could have taken off the dead floating animal so. I think it’s a problem. I’m saddened by the fact that the shrimpers have become so adamant about this problem that they see this as a final

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straw to their – to – to kind of eliminate them from the, you know, one of the traditional ways of making a living here because it started out when shrimp was cheaper from Mexico, when the price of fuel suddenly shot up in 1974, when regulations increased and regulations increased and the Mexican shrimpers were still getting subsidized fuel at a far lower price than us. And they feel that they’ve been regulated essentially out of business. And – and so it’s a shame because one time when we, when I, first started doing this, shrimpers would turn in turtles that they’d caught in their nets and I don’t think they would do that now. And it’s a shame because if there was a greater trust between the shrimping industry and the environmental people, then I think that we could probably work out some of these problems to the betterment of the sea turtle and – and perhaps to the betterment of the shrimping industry.

DT: Its gotten very competitive I guess among shrimpers.

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TA: Sure and in fact there are too many licenses out there and the shrimp are declining and then now the other thing that’s come in, of course, and has been for a while, but now the other, the other item is by-catch, the fact that to catch so many pounds of shrimp, you catch often many more pounds of other things which are a whole variety of everything from crabs to juvenile fish to – to mollusks and just a whole variety of bottom dwelling animals that generally die by the time they are put over the side, where certainly most of them die, especially the fish. Now one argument is, well this is, you know, were recycling it, they – they become food for somebody else. However, I think that the quantity of bi-catch is probably pretty – pretty big, its not sustainable. So – so that’s

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what happens with the sea turtles that I find. And – but we also did about five years ago I had a student working with me, her name is Pam Plotkin who’s now got her Ph.D., incidentally even though I don’t have students as such, I’ve often hired students who are doing part-time work for me getting paid and at the same time doing their, you know, working on their degree. Pam was one of them and what she did, well we did together, but what she did most of the – of the actual necropsy work and we looked at something like a hundred and ten, a hundred and twelve sea turtles that were washed up dead on the beach in a year and a half. And she looked at the stomach contents and found that over fifty percent of them had man-made materials in their stomach, mostly plastic materials. So the

– the other hazard to sea turtles and other animals, but sea turtles in particular, is either ingesting or becoming entangled in plastic. I found numerous examples of animals entangled in plastic.

DT: Somebody told me that many times turtles will think they're going after man of war and they'll actually find that its a plastic bag, the plastic bag will get ingested. Is that true?
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TA: Well, I think – I think it might be with the leatherback which feeds exclusively off jelly fish. And I'm sure that's how they perhaps ingest some of the plastic we find in their – in their stomachs. We never find whole plastic bags in their stomachs.

DT: I see.

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TA: We've found pieces of plastic, numerous of them, but you know, I think more likely is during the stage when turtles are pelagic, they have always been able to eat almost anything that's floating has been food for them. Now, it's not always food and I think that's why you can put something in an, you know, if I put some piece of plastic in one of my tanks there, they'd go for it. I don't know whether they actually mistake it for jellyfish or just some item that's floating and therefore it must be food. I have seen, I've seen a sea – I've seen sea turtles eating Portuguese men of war and we know that's part of their diet.

DT: Can you tell me a little bit about the fish or the marine mammals that come up and whether you see lesions or sort of peculiar things that might be related to their death or their stranding.

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TA: All right, yes, I can tell you in particularly in the dolphins. There are two kinds of lesions that we see on dolphins and small whales that wash ashore here. One is, and it sounds like I'm telling a tale but it's not. There is a shark called the cookie cutter shark and what it does is it somehow makes its living entirely by taking cookie shape bites out of large marine animals, especially mammals. And some of the dolphins that we find are literally covered in cookie cutter bites. There may be a hundred or more bites on their bodies, most of which will be healed. In other words, they don't kill them, they just take chunks of their flesh out and some of which will be open wounds, which will eventually heal. Quite extraordinary, and the cookie cutter shark has a little cookie cutter shaped mouth and the mystery is how on earth does, and it's a fairly sluggish shark, how does it manage to glom on to a pretty fast moving marine mammal when it does. So then – so often the animals bodies are covered in lesions. Many times too, the animals bodies are covered in scars and these scars are called rake marks and the males are particularly susceptible to rake marks and they're normally caused by the teeth of other dolphins, their own species during combat, periods of combat, when males fight males for dominance.

End Tape 2 Side A

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TA: Their own species during combat periods of combat when males fight males for dominance. And so that's another kind of scar or lesion that we find on them and sometimes quite severe.

DT: This is part of mating?

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TA: Part of mating or the mating process yes. And sometimes the babies will have it on them where their mothers have had to restrain them rather forcibly and so. I'm not saying,

you know, chastising them but maybe had to grab harder than, so – but then we also see some lesions and have seen lesions on dolphins in particular that are due to viral disease and, in particular, a disease called morbillivirus, which is a form of canine, of, well, it's a form of canine distemper which has got into the marine mammal population in the last few years. That's a big, big concern. And we've had two years where phenomenal numbers of dolphins have come ashore, bottlenose dolphins almost exclusively, and the diagnosis on those animals that could be diagnosed pathologically has been this morbillivirus. So now that's affected, let's say we find a live dolphin right now and the live dolphin could be a baby and it cannot be released because it doesn't know, it's not been taught by its parents anything and it doesn't have a pod to go to and – and it would almost certainly perish on its own. The solution has been to send those animals to a marine life park somewhere but with the threat of morbillivirus in the population, that avenue's been shut to us for doing something with a live stranding where the – where the animals recovered where we don't know what to do, we don't know how to we can't release it. But now none of the Sea World parks – the

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only time Sea World parks will take an animal is when it's – when it was a baby when it was found and they know that – and it's been tested to be free of morbillivirus.

DT: While you're on that topic, I know that there's been some controversy in sort of humane circles about the ethics of marine mammal captivity and performance, especially at Sea World and I was wondering what your feelings are about that. I know they've done some rescue work and I guess there are pluses and minuses there.

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TA: There is but I personally don't think marine animals should be in captivity, I mean it's my own personal feeling.

DT: They don't survive well.

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TA: They don't survive long – as long a life as they would have and although they often seem very happy and they put the – people think they're smiling but it's not, it's just the gape, the way they gape is – I'm not saying anything else so... And, of course, they seem like friendly, playful animals. They are playful animals. We've seen them out here in the wild playing with – playing with their dinner, playing with their supper, especially if it's a flounder. They'll toss a flounder around like a ball between one another. I've got some photographs of a flounder being played with by a dolphin before it is devoured.

DT: It's a game, fun, for some of them.

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TA: Yes. So, no I don't, and I'm also worried about the increase in dolphin petting and dolphin feeding activities. I don't agree with those. I think it's wonderful for people to – you know, there's always some argument for the general public to see these animals and appreciate them. And when you do see them, and I've been to the Sea Worlds before and when you do see them, they're such magnificent animals and especially when you see something like as big as a killer whale doing that stuff. But I would rather them not be in captivity myself.

DT: Have you seen many problems related to red tide along Port Aransas beaches?

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TA: Seen some phenomenal problems related to red tide. We've had two big red tides since I've been here. The first was in 1986 and that was probably the biggest and the second was last year. In '86, the red tide was a dinoflagellate and the particular species we get here is called *Gymnodinium breve* is the scientific name, although they keep changing that. The one in 1986 was called *Ptychodiscus brevis* but that's a taxonomic obscurity. It's the same organism and it's a dinoflagellate. If you saw it, it's – you would think that it was an animal and it's not. It's more like a protozoan I

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suppose. It – it has a flagellate and it whips around in the water, it can move around rapidly but it's a photosynthesizing organism, so sort of semi-plant, semi-semi-animal in a way. And in certain conditions give rise to it blooming in considerable numbers so instead it's always there, it's always in the – in the environment. But under certain conditions, which nobody really understands, it blooms into such proportions that it can actually make the water look reddish because there's so many cells per every little teaspoon full of water. The – when this happens, and especially when the organism starts to die, because eventually it kind of kills itself in a way because there's so many

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of them. It releases a toxin and this is how it's uncomfortable to us as human beings. You can detect that, it affects the mucous membranes, it affects the eyes. I've had to do my beach survey in a surgical mask at times. And I did one last year. I forgot my surgical mask and by the time I was finished, I've never had my eyes hurting so much. I thought I'd done severe damage to them.

DT: You weren't in the water?

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TA: No, no, this was in the atmosphere. Even there. And it's an acrid kind of a smell, very, very uncomfortable and people don't notice it at first and then they – they start coughing and they – and then it – then it makes you cough and it makes your eyes smart and then next it goes in your nose. And – but in the water now, it is almost instantaneously, because it is loaded with this toxin called brevetoxin. It is almost instantaneously fatal to fish. It interferes with their gill mechanisms for respiring and, and it kills them. They can – oh sorry I had that – you cut that bit out.

DT: The yawn.

076

TA: Yes, not that I'm bored but I might be tired though. It's been a tough, tough day already. They – so anyway, they can no longer breathe, they essentially asphyxiate.

DT: I see.

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TA: And you see them when they're in the dying phase, they're at the surface of the water gasping for air and they're gulping for air but they eventually die and so you have a huge fish kill. Now when the fish start rotting on the beach, combined with that aerosol atmosphere, it, it's pretty bad. And it affects not only the beach but it affects the humans and the tourism and everything else. So that happened in 1986 and they closed off some of the beaches. And the – the – the main danger, however to humans is the certain shellfish like oysters around here. They filter out this organism, they feed off it, it does them no harm, but they concentrate the toxin in the- in the muscle tissue. And when you eat them, no matter whether you cook them or not, you can get ill. You can't – this one doesn't kill

people, it's not like the paralytic shellfish poison but certainly made people feel ill, will vomit and

DT: Do you have any idea why these blooms happen?

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TA: No but we know, we've, as I said we had one in '86 and one last year in '96, it was ten years apart. The – one of the interesting things however was how they end. We do know that a certain salinity and temperature, they will not – they will not flourish in. That temperature is probably around sixteen degrees centigrade, below that, that's what, sixteen is sixty something, below sixty-five or so [Fahrenheit], and a salinity that's quite low, they don't – they don't like low salinity. In 1986, it took the first couple of storms to knock – knock it down. The same thing happened this year too.

DT: Do you think its related to nutrient loads?

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TA: Yes well they have to have, well they need, I'm not so sure about that but they have, they do require nutrients and so long as there's plenty of nutrients and plenty of sunshine those guys going to kind of flourish. When – but what actually triggers – they have a resting stage, they call it a cyst and the cyst is probably sitting in the sediment, and maybe something disturbs the sediment and they come up into the water column and – and the conditions are just right for them to multiply and then they multiply and multiply. But I don't, I don't know and I'm certainly not an expert on dinoflagellate but I don't think scientists in general know what really triggers such an event. But what ends it can be environmental, low salinity, low temperature as I said.

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Now there's another tide here, you know, the brown tide that's persisted for something like seven years now. This is in the Laguna Madre. And that is – it's believed was triggered by the freeze. In 1989, there was a really deep freeze. Do you know I measured a, I think I read an article about this in the Corpus Christi, in one of the newspapers. I'd just come back from the Antarctic and we did this trip in the Antarctic where the lowest temperature we measured was about minus 1.3 centigrade. I had, all the time I'm in the Antarctic by the way my instruments are measuring stuff here and recording for me so I had a current meter down in the, underneath the John F. Kennedy Causeway Bridge by Snoopy's restaurant and it was recording away and it measured the temperature minus 1.6, it measured, and here in South Texas it actually measured a temperature colder than we measured in the Antarctic because the Antarctic summer it was in thirty days of working down there. So I thought that was kind of an interesting contrast. Plus, the salinity of that water was probably, well, I've forgot the numbers but I think if I remember it was forty-five or fifty parts per thousand.

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So that is unique seawater if you can even call it seawater. I don't know there's any other place in the world where you will get minus 1.6 at forty-five parts per thousand temperature. A huge fish kill resulted from this, and not only the fish but it was so cold that it penetrated into the sediment and killed many of the invertebrates that were there. There are masses of invertebrates in the sediment of the Laguna Madre and elsewhere. So this provided a big nutrient impact but there are some people that think that it was also coincidental with the King Ranch changing some of their practices to

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increase the agriculture. They increased their agricultural lands by a considerable amount just prior to that. And therefore some people say well there was more runoff due to the fact that most, more, you know, nutrients coming in from the, from the fertilizers that they use. However, there's some counterarguments to that because the, it was a drought year. 1989 was a drought year so there probably wasn't much runoff. And the other factor that – that caused the brown tide to precipitate was very low, low tides because it was so cold and the water actually shrinks. I don't know if you realize that, but water shrinks, of course it gets less, more dense and – and occupies less space and that actually is sufficient in the shallow waters to be noticeable. And so all of this combined to produce high nutrients, big kill, and this brown tide flourished and it's been there ever since. It's not toxic, but it's cutting off the light to the sea grass beds and that's going to be one of the – well, its going to be a big problem.

DT: You mentioned something awhile back about the red tide being toxic to people who eat shellfish and I'm curious if you read in the paper not too long ago about a Landry's branch restaurant which is in New York and a fellow ate some oysters that came from Texas and got some sort of terrible necrotic parasite that just, you know, ate him alive, he literally died. And I'm wondering, beyond sort of extreme things like that, if you eat raw oysters?
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TA: I don't, no.

DT: What is your thought about the health of the oyster reefs in Texas at least this point?
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TA: Even when I know that when the health department says it's okay it probably is okay, I'm still leery of eating raw oysters.

DT: Even during the winter?

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TA: Yeah. Although, you know, the red tide, the red tide is one of the, one of the hazards but more, a far greater hazard will be the pollutants and other things that

DT: Bacteria.

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TA: Yeah, bacteria and so on. So I like oysters but, but I don't eat them raw anymore.

DT: I wonder if you could comment just sort of generally on your role of being an observer and a witness to this. It seems like few people are as observant as you are and as careful at taking notes and I'm wondering why you found yourself in this role and how you think that's valuable?

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TA: Well I've always been an observer and, how did I find myself in this role? It just fascinates me. The environment fascinates me. When I say the environment I don't mean in that sense that most people have, you know. I mean the surroundings that I live in, the natural surroundings that I live in. I can look at a – I can go and look at a flower bed or something and see bees and ants and things and I'm just fascinated by all these things and I'd love to really understand how the whole thing works. So that has led me to perhaps that desire to understand how the beach works, has led me to observe not only the things that I'm, that I'm primarily interested in, such as the bird population, but just about every other aspect of it that I can, can absorb. And I do think that's

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important. I think it's important to make notes about it because, even though, by the way, if

not by computer. When I had the clipboard I would write notes, more notes than I write in the computer. So what I did was every time I saw, every mile I'd stop on the beach and I'd make a measurement of the, where the dunes are and so on. And I have it to force me to write notes. It says "notes?" and so I have to write something in the notes but, because I think that first the measurements are essential because our memories are not reliable. Even my own memory about the beach is not reliable. But when you put

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together the numbers and the time and the chronological sequence of, of when things happen then you find out, especially if you do it for a long time, you find out when things really do happen, how many of those things happen. When people say to me, "boy, I haven't seen many Portuguese man of war this year or something", or, or, "boy, there's a lot of tar on the beach". In fact, my measurements have shown that tar is far less now than it has been for, for many years. People think that certain things occur at certain times of the year and, because what they remember from a few visits here but

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I've found out that, in fact, they occur almost all year round or they don't occur at the time of year that – that people generally think they do. So it fascinates me to try and understand this. And, because I don't know, I just like to collect. I like to see. I like to plot things out and to see the passage of time. It's fascinating to me. And when you do something like this, when you do something daily, I measure, I do the – the weather here daily, you begin to get a feeling for things and you begin to get a feeling for the seasonality of things. Seasonality is very interesting in nature because, you know, the – the migration of birds, for example, and – and when the birds go through their different plumage changes. Many people here, for example, think that there are two species of gulls if they think at all about gulls. One – one has no black head and the other one has a black head. But it's not, it's the laughing gull going through his seasonal change and you'd be surprised how early that happens. They start to get – some of them start to get their black caps in late December for the spring. And so this kind of thing just fascinates this to discover when the limits of things, when they happen, the chronological order of

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things and – but I do believe it's important because it's only through its sort of a legacy. It's only through notes like this and measurement's like this that future generations might be able to understand what – what actually happened at this time and how it's varied from – how it's different from what's happening in a hundred years' time.

DT: I guess related to that, the historical scale, I'm curious if you can sort of put things in perspective as far as the pace of change. It seems like there's been really dramatic changes in the amount of development on the island. Can you sort of comment on what you've seen since you came here? When you first saw it in 1977 some for sale signs and how the landscape has changed.

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TA: Yes. In order to refresh my memory, by the way, too, I take photographs of absolutely fixed spots every few years and repeat them every few years just to see how they've changed. I have a half-mile interval along my beach on the beach side and a half-mile intervals along the roadside. Let's take the beach side. When I started this, there was not a single man-made structure between access road number one and number two. Now there are twenty-two of them and ranging from private houses to, to the big condominiums.

That's an ob – pretty obvious change. Beach posts, signs on the beach, all of these have proliferated. Fortunately some of those things don't last for very long.

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Unfortunately for me, the – I'm doing beach morphology measurements, have been doing those for years to see how the erosion is taking place, how the dunes are building and I need some kind of permanent, permanent data. I do it very crudely, I just measure the width of the beach from the, from the shoreline to the high tide line to the dune line and to some fixed point.

DT: And how has that changed?

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TA: It's quite dramatic but not dramatic enough that people notice it. Hurricane Allen in 1981 [1980] took away probably a hundred feet of dunes but what it did which was surprising was the sand from those dunes that were eroded away by the storm did not – it wasn't a big enough storm that it pushed them all the way across the island you know like the really major storms have in the past. But it actually increased the width of the beach. The beach was wider considerably after Hurricane Allen than it was before. But then I'd watch that slowly erode away until it, and the dunes build up subsequently so the sand that was deposited on the face of the shore face then got pushed back up into the dunes. But the big problem is driving on the beach. You see, all these measurements are – don't tell what's happening in a natural beach environment but do tell what's happening in the real world environment because people drive on the beach. So that makes a lot of difference. Anyway, I've digressed a little bit. As the beach narrowed, and it narrowed until 1988 when Hurricane Gilbert came along and took away far less amount of the dunes but also increased the width of the beach. However, the beach is slowly eroding.

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It's in an eroding stage so the front of the beach if you like, is slowly moving back. Now the dunes themselves may be slowly moving forward, but every now and again get knocked back by one of these storms. So we are in a slightly erosional state. We're nowhere near, as Galveston, for example – an area where they're eroding as you can tell if you drive along Highway 87 and beyond Galveston. It's closed I think most of, much of the way, or even the road on Galveston Island past San Luis Pass. That's often encroached upon by the sea. So we're not as bad as that but we are in a, the beach is eroding. Now the other thing that I've seen in that – that respect is... Oh, let me get on with the changes on

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the, on the road side which is indicative of the – the pace of change of Port Aransas itself. I've seen sign posts go up, great big sign posts that weren't there, these, you know, advertising, massive advertise posts, whole lines of telegraph poles have come in that weren't there. The road which was once a two-lane highway is now essentially a four-lane highway with the paved shoulder that they put on it. People say, hey that's – that's great, it makes the road a bit more safe, it makes the road much safer, but I really used to enjoy when we come off the turnoff from – from Corpus and come down, I used to really enjoy that eighteen mile drive of absolutely nothing there, or thirteen miles it was. It was the thirteen miles straight be – before you got to the first part of Port Aransas and somehow there was something about that long, narrow, straight road that was really interesting. It's going to eventually become a four-lane highway, a proper one, it will. All the telegraph poles that have been put up there to take care of the increased demand

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of electricity, all these things have popped up, all the signs for the condominiums. I've also seen unsuccessful condos, you know, they put up a sign, they erect an office. They give it a fancy name and then you realize nothing's happening and then they go away and they leave their signs, they leave their office. They should be made to take them with them.

DT: There is something about that sort of "road of broken dreams", these pipe dreams in some sense, but I guess they are legitimate hopes of some of these people that things were turning out.

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TA: Well what about – there's also one stretch that was never used. The – it was supposed to be a health spa and it's in the middle of a lake there. And as soon as it was built it was abandoned.

DT: Peculiar.

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TA: Yeah. There's some of the signs that were put up, there is a – somebody scrawled about ten years ago, "keep her wild, keep her wild", right.

DT: I saw that.

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TA: Somebody came along just the other day and – and reinforced that bit of graffiti which I don't mind because it was stuck on somebody's sign and it would be nice to keep her wild. But Mustang Island I think is not going to be kept wild. They always talk about planned, careful planning but they went to great lengths to make sure that Mustang Island was not declared to be an undeveloped area and so the whole of the island is considered to be developed and can be therefore used for further development and will be. I know it will be. So I think my study will eventually be useful. See, I'm looking ahead for my own interest. Of course, I can't look a hundred years ahead. I want to see what changes are over say one of the long tidal cycles like the eighteen and a half

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year tidal cycle. I'd like to see what kind of a change – whether I can correlate anything with that over some of the longer term annual cycles. But from the future, we need to look not just twenty years ahead, we need to look a hundred years ahead or more. And one of the problems is that we don't do that. We – we – we discuss things about our future in terms of the next four-year political election cycle, rather than really looking far ahead. I think as – as a race of human beings we have to do that. We need to do that but there's nobody doing that at the moment. There are a few kind of think-tank type groups and so on.

DT: How would you respond... I talked to a fellow who claimed not to be too concerned about what was happening to Galveston Island by saying (he was a geologist), and he said, "in the big picture, A) we're all dead, and B) in the very big picture, you know, global warming is rising the seas and the barrier island is five thousand years old and it won't be there for long, so the finger-fill canals and so on that you might be concerned about are a short-term problem". What's the answer to that?

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TA: I was – he may have a certain amount of truth to what he says, yes. It – should global warming continue and we see some, we see some – some things changing, but I suspect that global warming will continue for awhile then these barrier islands will – will not be here anymore. Slightly around about the age, it's probably more like somewhere between

seven and fifteen thousand years, but nonetheless, had we not, however interfered with them by building these substantial passes with jetties, stone jetties, they're – they're constantly on the move. They would have been constantly on the move and people wouldn't have been able to have developed the way that they developed because their property would be sand dunes. But we stabilized the sand dunes, we stabilized the islands and – and I don't know, you see there's so, there's so many

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arguments. People say, "well, what – we were a natural organism too, we're human beings, we're part of the ecosystem. We should be able to look after ourselves and to look out – out for our own good. And there are a lot of people that believe that many of these things that we deal with are minor compared to the problems that human beings face. And it's hard to argue. Now when the – when the shrimpers say, "well", and, of course, everybody exaggerates. So they say, "well, you're taking the food from our children's mouths for a few sea turtles". And I happen to believe in those sea turtles but I

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also have certain empathy for people who are trying to make a living. I just wish they would be – do it more responsibly and I think we can do it more responsibly. The other aspect of shrimping and other activities that are going on in the sea is the – the amount of garbage they dump in the sea. I mean, it's like they don't respect the – these people who make their living from the sea do not pay for the land if you call it that, they – they harvest or that they pull out of. They don't pay money for it, it's free. And yet it seems just from the quantity of stuff and the identity of the stuff that I find on the beach that many people don't respect it at all, not – no one – none whatsoever, have no respect for it and – and that saddens me. So therefore my sympathies tend to go to the animals that have no choice and the animals that don't deliberately do something that would harm their environment and the – and the balance to the people that have the ability to look after things and don't. And so I – therefore I'm going to be the defender of every little bit of land that gets used up for some – like this great big RV park that's just sprung up and is absolutely full here now, have you seen that?

DT: Yeah.

405

TA: The Neon Run? It was full within two weeks of its construction! People who wanted to build golf courses of – and golf courses utilize water that we don't have, and – and golf courses use pesticides and insecticides that will leach out into the environment. So I'm afraid my sympathies, not afraid, I mean my sympathies do therefore tend to go along with the animals because I love this, I mean, I love the beauty of this – this place in the early morning and I want to see that. I don't want to see a whole pile of condominiums and people riding in balloons behind aircraft and – and zooming along in those awful

End Tape 2 Side B

001

TA: And zooming along in those awful vehicles that you see so many of, what do you call them?

DT: Sea Doos, jet skis.

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TA: Jet skis, yeah.

DT: I see that we're coming close to two hours, over two hours. I usually have two

questions I try to ask people that are common to everyone. One seems trite but sometimes it can be sort of poetic. A favorite spot that you have?

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TA: Well it's probably not the beach itself but the backside of the island beyond the – the little airstrip that we have. I could go back in there and it's right in the marsh and – and I could be pretty much alone and really in communication with nature because it's full of buzzing insects and – and waving seagrasses and chirping birds. And that's probably one of my favorite spots here in Texas.

DT: The other thing I like to ask is after I've asked many questions and maybe too many, is there something that you feel like we haven't covered that you want to talk about?

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TA: Well, I don't know, we seem to have covered an awful lot and I've probably been fairly rambling.

DT: The letter in a bottle? What would be your letter in a bottle?

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TA: Well I've already – I've put a couple out myself.

DT: What did they say?

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TA: Well I can't recall because it was such a long time ago. Ah, I know what, you haven't asked me about some of the things I found on the beach other than letters in bottles, but one of the things I find quite often, being in the oceanographic business are instruments, buoys that washed ashore that some guy who's is my own business has lost or in the seismic industry has lost. And what I have made a specialty of tracking them down, I track them down through serial numbers and knowing the companies that make them and return their – their instruments to them. But the most amazing thing was I've lost a few instruments myself and I lost a current meter off, maybe sixty miles off shore and I actually found it on the beach, I found my own current meter on the beach! I thought it was lost for good, it washed up, it was covered in barnacles and – and I found it myself on the beach! So, well, I think one – one of the things that I would love to find would be my.. Is that the end? (beeping) Is that the end?

DT: Keep going.

028

TA: Well my – my own bottle that I put in the – in the – I put it in with a bunch of Argentines, we made the most – we made the world's best bottle. We sealed that with all the techniques of the, at our command and we put a message in. I don't even know what it said, it was an Argentine, I was in an Argentine ship in the Antarctic. And we put this bottle in with a note probably giving all our names and if you find it, and my fantasy is to find that bottle washed up on the south Texas beach.

DT: What did it say though?

033

TA: I can't recall. I don't think it was any philosophical message. It was probably, oh it might have said because it might have been after a party. The – the Argentines like to like to drink their wine on board the ships. American ships we tend to be dry, sober, supposedly. So but we sealed it and chucked it in the Antarctic Ocean and who knows, maybe it'll wash up somewhere. Theoretically possible to wash up here, it would take a very tortuous path but...

DT: That would be a happy ending, hope you find it. Thanks very much for your time.
End of audio tape 3, side A, drawn from video reel 1005
End of interview with Tony Amos